PREDICTING BACTERIAL SEPSIS IN COMMUNITY ACQUIRED INFECTIONS USING CLINICAL AND LABORATORY PARAMETERS INCLUDING PLASMA NGAL

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Objective: Community acquired bacterial sepsis is one of the leading causes of morbidity and mortality. However, diagnosis of bacterial sepsis is difficult because detection of bacterial growth by blood culture takes time and the yield is poor. Many of the current diagnostic scores such as the SIRS, qSOFA and SOFA score do not have adequate sensitivity and specificity for predicting bacterial sepsis. Biomarkers such as procalcitonin were also found to have limitations. Therefore we aimed to find a combination of clinical and laboratory parameters including a new biomarker plasma NGAL which could predict bacterial sepsis and aid in early diagnosis and guide appropriate antibiotic therapy.

Method: This prospective cohort study included patients presenting to the Emergency department of a tertiary care centre with acute febrile illness and features of SIRS. Clinical and laboratory parameters at the time of admission including, but not limited

to, complete blood counts, creatinine, liver function tests, blood culture, plasma NGAL, and chest x-ray were documented using a predesigned proforma. The patients were followed up for the duration of their hospital stay and the cases were selected based on a positive blood culture or a final discharge diagnosis of bacterial sepsis. The controls were the patients who did not fulfil the criteria for cases and had an alternate diagnosis established. Logistic regression using univariate and multivariate analysis was performed for identifying independent predictors of bacterial sepsis.

Results: A total of 100 patients were included in the study with a mean age of --- of which --% were men. Among them 41 patients had definite or probable bacterial sepsis and 38 were controls. The remaining 21 did not have a definite diagnosis established and was not included in the analysis. The following parameters, rigors (RR 1.35, 95%CI 2.04-2.27), qSOFA ≥2 (RR 1.63, 95% CI 1.04-2.51), an obvious focus of infection (RR 3.15, 95% 1.76-5.96) and elevated creatinine (RR 1.51, 95% CI 1.12-2.03) were found to be independent predictors of bacterial sepsis. Plasma NGAL had a relative risk of 1.19 with 95% CI 0.98-1.44 (P value 0.086) in predicting bacterial sepsis. Plasma NGAL level for patients with positive blood culture (bacteraemia) had an area under the ROC curve of 0.76 (95% CI 0.66 - 0.87) with a sensitivity of 71.43% and specificity of 69.62% at a cut off value of 1044 ng/ml.

Conclusion: Clinical parameters such as rigors, qSOFA score ≥2 and an obvious focus of infection were independent predictors of sepsis. Among the laboratory parameters, elevated creatinine predicted bacterial sepsis whereas elevation in plasma NGAL was not found to be statistically significant.